Missouri Assessment Program
Spring 2006

Mathematics

Released Items

Grade 8

The McGraw-Hill Companies

CTB McGraw-Hill

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1 What is the value of y in the equation $y = \frac{1}{3}x + 3$, when $x = 9$?

- ○ 3
- ○ 6
- ○ 12
- ○ 30

2 The school is planning to build either a new swimming pool or a new gymnasium. Doug is conducting a survey to determine which project students prefer. Which sample is ***most likely*** to result in an unbiased survey?

- ○ all students watching a basketball game
- ○ all students participating on the basketball team
- ○ all students using the community pool after school
- ○ all students attending a homeroom class in the morning

3 Which of these is equivalent to $2y + 5 < 35$?

- ○ $y < 15$
- ○ $y > 15$
- ○ $y < 20$
- ○ $y > 20$

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4 Look at the pattern of geometric figures below. Each geometric shape in each figure is congruent. Figure 1 is labeled with the lengths of the sides.

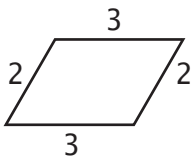

Figure 1


Figure 2


Figure 3

Complete the table below to show the perimeter for the first six figures in the pattern.

Figure	Perimeter
1	10
2	16
3	
4	
5	
6	

On the line below, write a rule that describes how to find the perimeter of any figure in this pattern after figure 1.

_____

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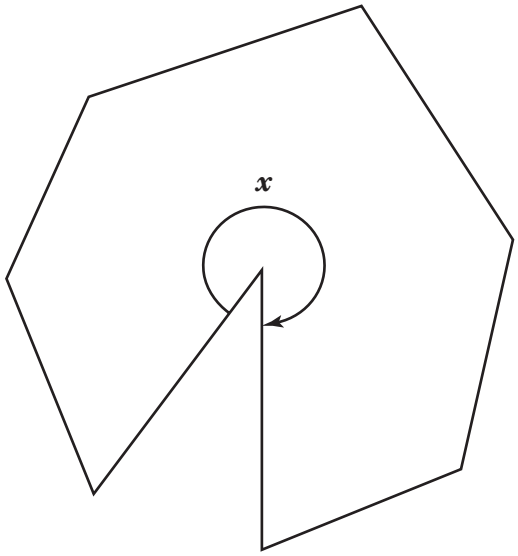
5 Use your protractor to help you solve this problem.

Look at the figure below.



What is the measure of angle *x* in the figure?

- ○ 37°
- ○ 120°
- ○ 240°
- ○ 323°

6 Melissa uses 9 cups of milk to make pancakes. How many ***quarts*** of milk will Melissa use to make the pancakes?

- ○ 1.1 quarts
- ○ 2.25 quarts
- ○ 3.0 quarts
- ○ 4.5 quarts

7 Joe has a sales job that pays him $3,000 per month and he also earns 10% of his monthly sales as a commission.

On the line below, write an expression that can be used to find Joe's total earnings for a month. Let *d* represent his sales for the month, in dollars.

expression _____

One month Joe's total sales were $34,000. What was the amount of Joe's earnings for that month?

$ _____

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8 Study the table below.

x	y
1	$^{-}1$
2	1
3	3
4	5

Which equation describes the relationship between the x and y values in the table?

- ○ $y = x + 3$
- ○ $y = x - 3$
- ○ $y = 2x + 3$
- ○ $y = 2x - 3$

9 Look at the pattern below.

5, 13, 29, 61, 125, . . .

Which expression represents the next number in the pattern, where p is any number in the pattern?

- ○ $2p + 3$
- ○ $2(p + 3)$
- ○ $3p - 20$
- ○ $3(p - 20)$

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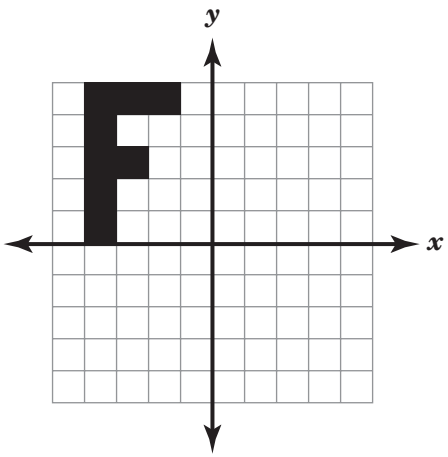
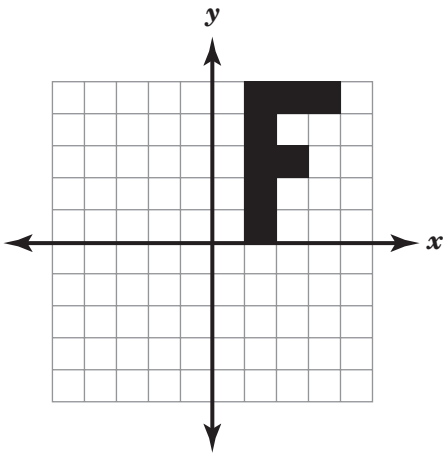
10 Study the figure shown on the grid below.



Which of these shows the figure reflected over the *x*-axis?

○


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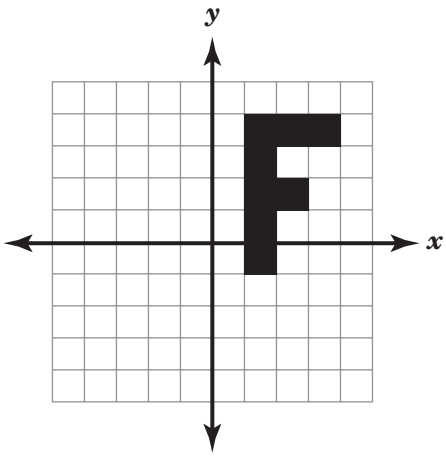

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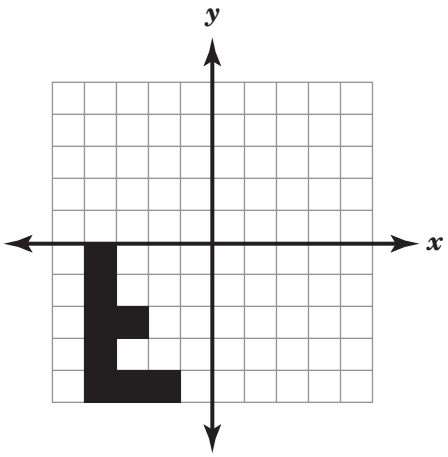

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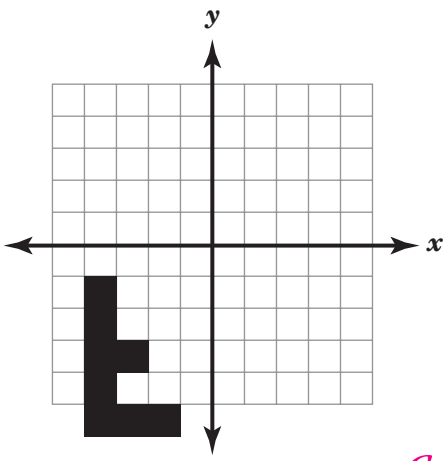

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11 Frank wants to go bowling. The bowling alley charges $4 per game and a one-time charge of $3 for bowling shoes. Look at the information in the box below.

$y = 4x + 3$
y is the total cost of bowling
x is the number of games bowled

Based on the information, which of these is a true statement?

- ◯ The total cost will increase by $4 for every game bowled.
- ◯ The total cost will increase by $3 for every game bowled.
- ◯ The total cost will increase by $4 for every 3 games bowled.
- ◯ The total cost will increase by $3 for every 4 games bowled.

12 Based on theoretical probability, if a coin is tossed 1,000 times, what would be the expected number of heads and number of tails? In the box below, write your answer and explain your reasoning.

_____ heads _____ tails

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13 The stem-and-leaf plot below shows the ages of 40 visitors to a science museum.

AGES OF VISITORS TO THE SCIENCE MUSEUM

0	7 8 9 9 9 9
1	0 0 1 1 2 3 4 4 5 5 6 7 7
2	1 1 1 3 5
3	2 5 5 6 8
4	4 9
5	3 9
6	1 2 3 9
7	0 8 9

Which age range had the most visitors?

- ○ 0 to 9
- ○ 10 to 19
- ○ 20 to 29
- ○ 30 to 39

14 Eric and Sheila are writing each letter of their names on separate pieces of paper and putting them all in a box. They will pick one piece of paper from the box without looking, record the letter, and return it to the box. They will pick 40 times in all. How many times is the letter "i" likely to be picked from the box?

- ○ 4
- ○ 8
- ○ 12
- ○ 20

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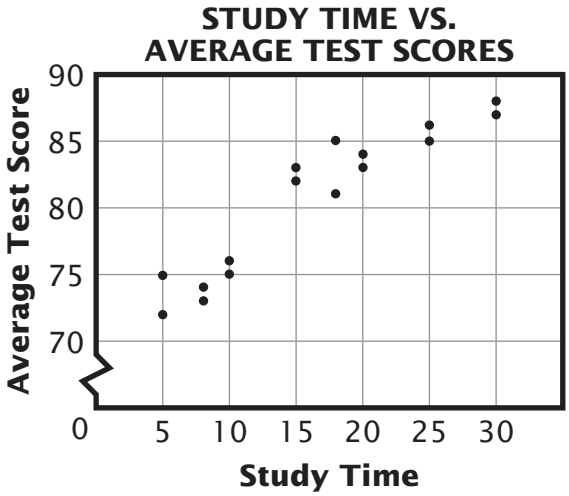
15 Which of these expressions is equivalent to $^{-}14(3 - 2x) - 6x$?

- ○ $42 + 22x$
- ○ $^{-}42 - 34x$
- ○ $^{-}42 + 22x$
- ○ $^{-}42 + 34x$

16 Mr. Thomas wanted to know if the amount of class time that he gave students to study affected their test scores. The scatter plot below shows the results.



What kind of relationship between class study time and test scores is shown on the scatter plot?

- ○ no correlation
- ○ positive correlation
- ○ negative correlation
- ○ positive then negative correlation

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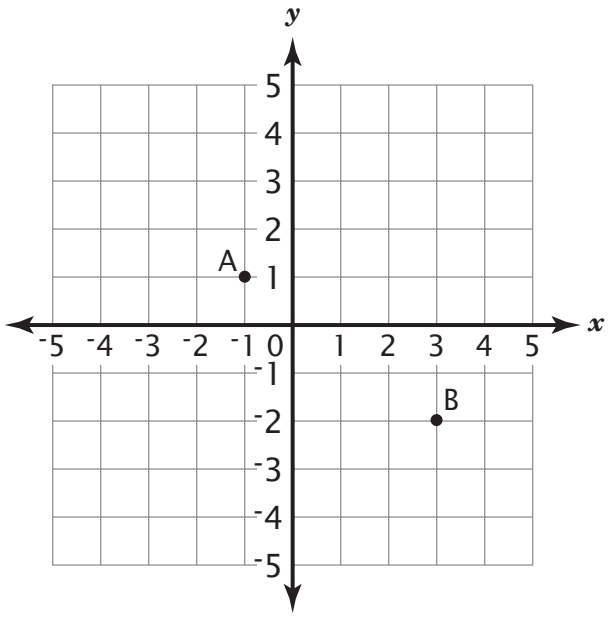
17 Points A and B shown on the coordinate grid below represent two vertices of a right triangle.



A line drawn between points A and B forms the hypotenuse of the right triangle. What are two different sets of coordinates for point C that could complete the right triangle ABC ?

(_____, _____) or (_____, _____)

In the box below, find the length of the hypotenuse, in units, and write your answer on the line.

_____ units

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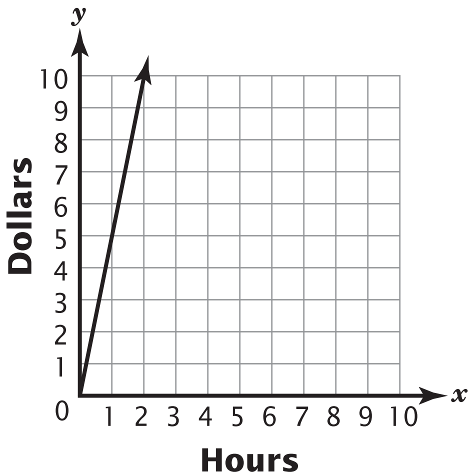
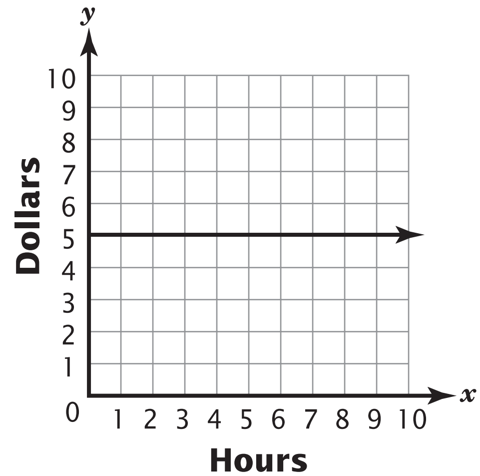
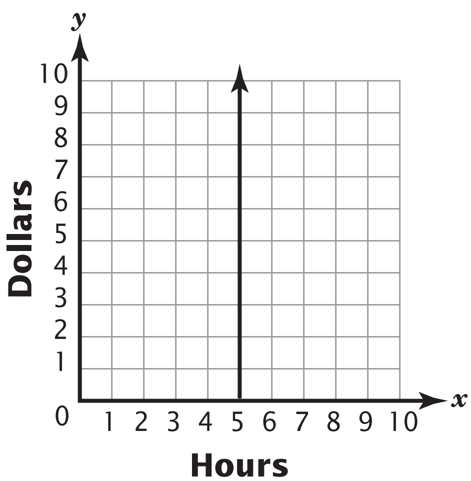
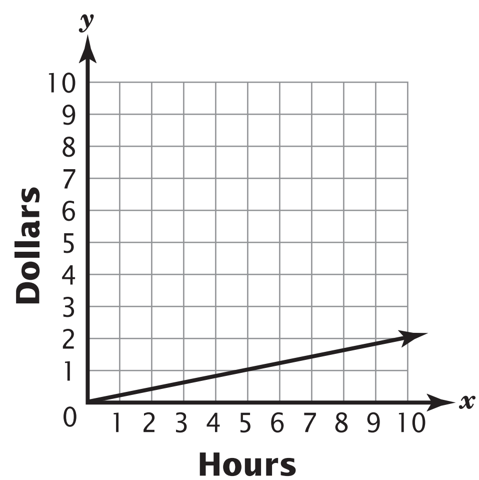
18 Gina has a summer job that pays $5 per hour. Which graph shows the relationship between the number of hours Gina works and the amount of money she earns?

○ 

○ 

○ 

○ 

19 Brian collected the data below to show the number of computer games owned by his friends.

12 15 2 11 12 38 17 13 14 16

Brian calculated the mean after removing the outliers. What was the mean number of computer games, to the nearest whole number, with the outliers removed?

- ○ 12
- ○ 14
- ○ 15
- ○ 20

20 Jeremy makes and sells wooden toy boats. For each boat, it costs him \$2.00 for the wood and \$1.00 for the materials to decorate it. He sells each boat for \$7.50. Which of these expressions could represent the amount of money that Jeremy will make selling n boats after his costs to make each boat are deducted?

n = number of boats sold

- ○ $7.5n - 3$
- ○ $7.5n + 3$
- ○ $n(7.5 - 3)$
- ○ $n(7.5 + 3)$

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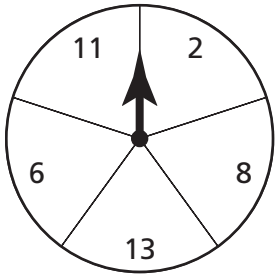
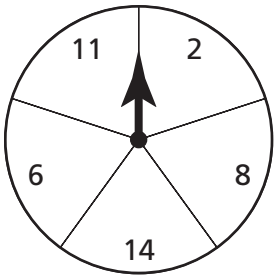
21 Marcus spun a spinner 50 times. The frequency table below shows the results of his experiment.

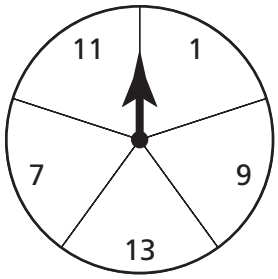
SPINNER RESULTS

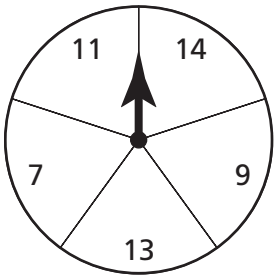
Type of Number	Frequency
Even	13
Odd	37

Which spinner did Marcus ***most likely*** use?

○ 

○ 

○ 

○ 

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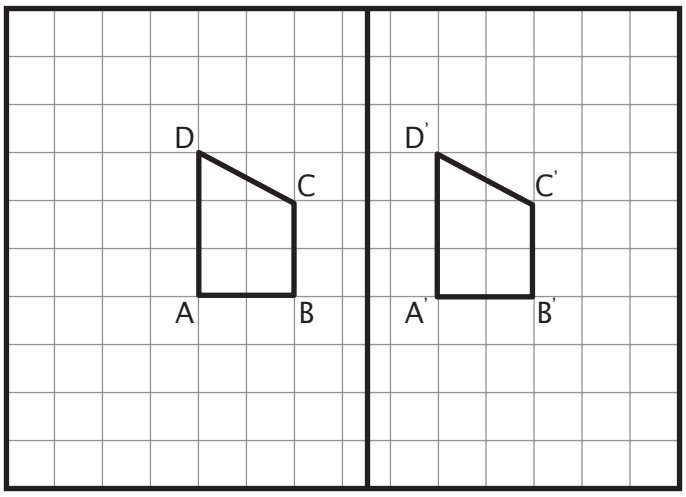
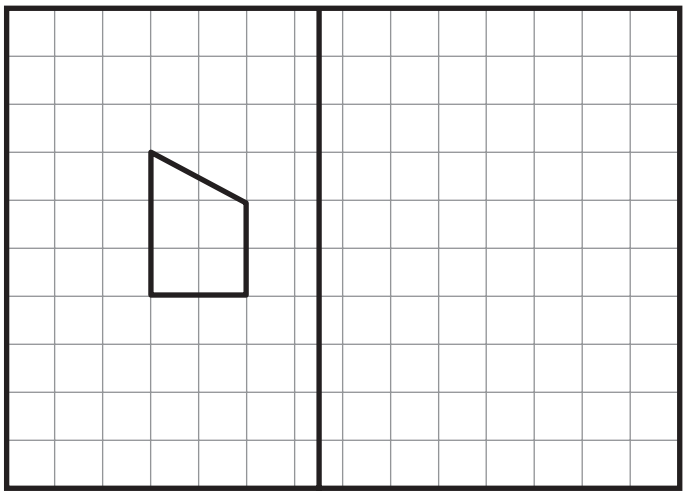
22 A transformation of trapezoid ABCD over the line results in image A′B′C′D′ as shown on the grid below.



On the line below, name the transformation of trapezoid ABCD.

_____

On the grid below, draw the reflection of the trapezoid over the line.



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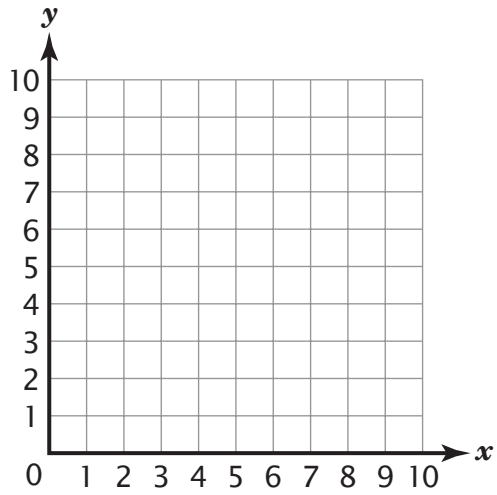
26 Use the coordinate grid below to help you solve this problem.



The vertices of a parallelogram are plotted at coordinates (0, 2), (2, 5), (6, 5), and (4, 2). What is the area, in square units, of this parallelogram?

- ○ 4 square units
- ○ 8 square units
- ○ 12 square units
- ○ 16 square units

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27 The table below shows the number of minutes Alison has practiced her music this week.

MUSIC PRACTICE

Day	Time (in minutes)
Sunday	20
Monday	15
Tuesday	30
Wednesday	40
Thursday	25
Friday	20
Saturday	?

How many minutes will Alison need to practice on Saturday to have a mean of 30 minutes of practice for the week? In the box below, write your answer and provide the work that shows how you arrived at your answer.

_____ minutes

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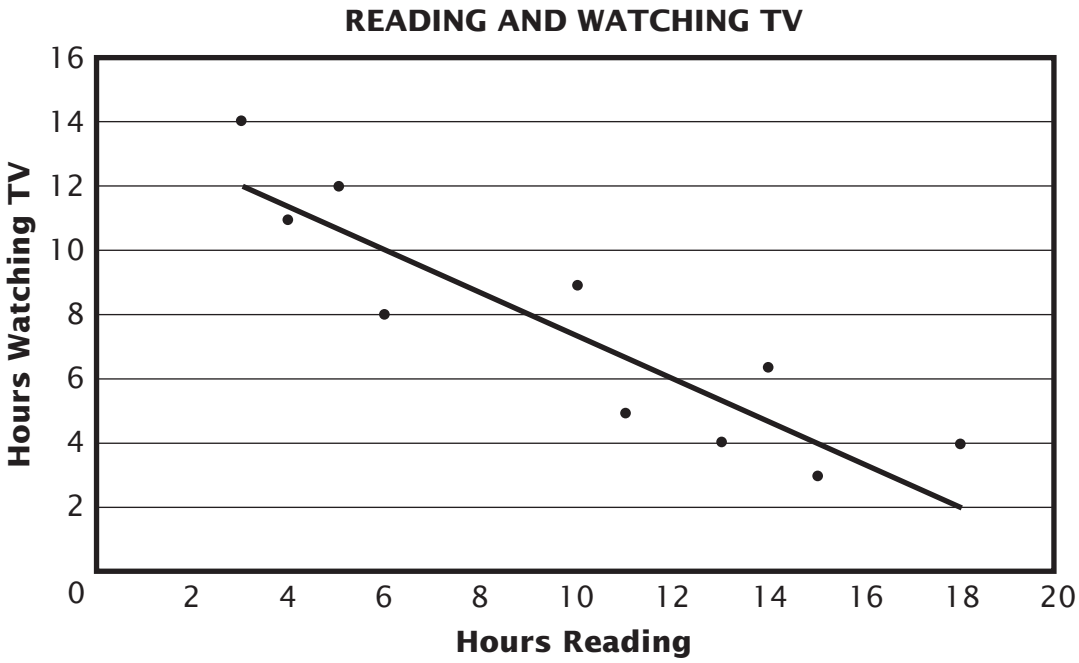
28 Susan surveyed students to find the amount of time they spent reading and watching TV last week. The scatter plot below shows the results of her survey.



According to the data in the scatter plot, how many hours of reading would you expect from a student who watches 6 hours of TV each week?

- ○ 8 hours
- ○ 10 hours
- ○ 12 hours
- ○ 14 hours

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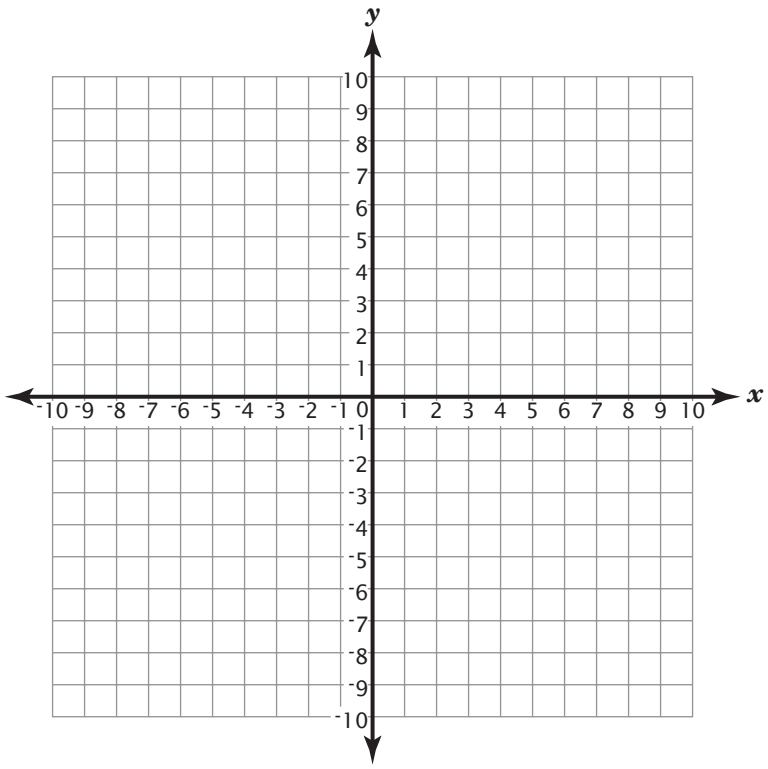
29 Marco wants to draw a square with an area of 9 square units on the coordinate grid shown below.



Which pair of coordinates could Marco use to plot points for the ***opposite*** vertices of the square?

- ○ (2, 4) and (2, 7)
- ○ (2, 7) and (5, 7)
- ○ (2, 4) and (5, 4)
- ○ (2, 4) and (5, 7)

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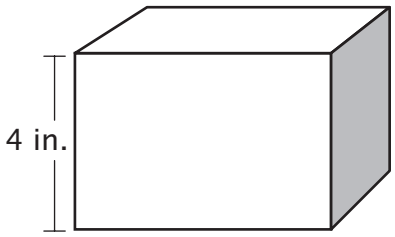
30 A restaurant owner plans to design a new container for his French fries. A diagram of the type of container is shown below.



The new container must meet the following requirements:

- shaped like a rectangular prism
- volume of 160 cubic inches
- dimensions for the length and width must be whole numbers greater than 1 inch
- height of 4 inches

In the box below, design three different containers that meet the requirements. List all the dimensions for each container. Identify which container has the least amount of surface area. Support your decision by showing all of your work for each container.

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